BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:	Group Art Unit: 2882
Edward J. SEPPI, et al.	Examiner: Jurie Yun
Serial No.: 10/687,573	Confirmation No. 7129
Filed: October 15, 2003	
For: MULTI-ENERGY X-RAY SOURCE	

APPEAL BRIEF UNDER 37 CFR § 41.37

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P.O. Box 1450
Alexandria, VA 22313-1450

Applicant submits this Appeal Brief pursuant to the Notice of Appeal filed June 6, 2007.

This brief is submitted in triplicate.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee Varian Medical Systems Technologies, Inc.

II. RELATED APPEALS AND INTERFERENCES

To the best of Applicant's knowledge, there are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 4, 5, 14-20, 26, 35-38 were canceled. Claims 1-3, 6-13, 21-25, 27-34, and 39-55 are pending. Claims 1-3, 6-13, 21-25, 27-34, and 39-55 are rejected, and are appealed. Claims 1, 21, and 39 are independent claims.

IV. STATUS OF AMENDMENTS

Amendment After Final under 37 C.F.R. § 1.116 was filed on April 9, 2007, in which claim 32 was amended. The amendment was not entered according to the Advisory Action mailed on April 19, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present section of the Appeal Brief is set forth merely to comply with the requirements of 37 C.F.R. § 41.37(c)(v) and is not intended to limit the pending claims in any way.

Claim 1 recites:

An apparatus for use in a radiation procedure, comprising:

a radiation filter having a first portion and a second portion, the first and the second portions forming a layer for filtering radiation impinging thereon, wherein the first portion is made from a first x-ray filtering material, and the second portion is made from a second x-ray filtering material;

a structure having a cavity, the radiation filter in operative association with the structure; and

a disk located within the cavity, the disk having a first target material and a second target material, wherein the first target material corresponds with the first portion of the radiation filter, and the second target material corresponds with the second portion of the radiation filter.

Claim 21 recites:

A method for generating image data, comprising:

generating a first x-ray radiation using a first target material;

applying a first filter factor to the first x-ray radiation to obtain a first filtered radiation;

generating a first set of image data in response to the first filtered radiation;

generating a second x-ray radiation using a second target material;

applying a second filter factor to the second x-ray radiation to obtain a second filtered radiation; and

generating a second set of image data in response to the second filtered radiation;

wherein the first and the second filter factor is applied automatically using a machine.

Claim 39 recites:

An apparatus for use in a radiation procedure, comprising:

a structure;

a first radiation filter secured to the structure;

a second radiation filter secured to the structure;

a first target material;

a second target material; and

a positioner coupled to the structure, the positioner configured to move the structure between a first position and a second position, wherein the first radiation filter is adapted to receive a first radiation generated using the first target material, and the second radiation filter is adapted to receive a second radiation generated using the second target material, wherein the second radiation is generated after the first radiation is generated.

With respect to claim 1, examples of an apparatus having a radiation filter having a first portion (e.g., 464) and a second portion (e.g., 466) (p26, lines 15-16), the first and the second portions forming a layer for filtering radiation impinging thereon, wherein the first portion is made from a first x-ray filtering material, and the second portion is made from a second x-ray filtering material, a structure (e.g., 410) having a cavity (e.g., 418) (p21, lines 10-13), the radiation filter in operative association with the structure, and a disk (e.g., 416) located within the cavity, the disk having a first target material (e.g., 474) and a second target material (e.g., 476) (p21, lines 10-13), wherein the first target material corresponds with the first portion of the radiation filter, and the second target material corresponds with the second portion of the radiation filter (p30, line 51 to page 31, line 10), are described in paragraphs 41-51 of the specification.

With respect to claim 21, examples of a method for generating image data that comprises generating a first x-ray radiation using a first target material (e.g., 474), applying a first filter factor (e.g., 464) to the first x-ray radiation to obtain a first filtered radiation (p27, lines 13-18), generating a first set of image data in response to the first filtered radiation (p11, lines 15-19), generating a second x-ray radiation using a second target material (e.g., 476), applying a second filter factor (e.g., 466) to the second x-ray radiation to obtain a second filtered radiation (p27, lines 18-22); and generating a second set of image data in response to the second filtered radiation (p11, lines 15-19), wherein the first and the second filter factor is applied automatically using a machine (p27, lines 7-22), are described in paragraphs 41-51 of the specification.

With respect to claim 39, examples of an apparatus having a structure, a first radiation filter (e.g., 464) secured to the structure, a second radiation filter (e.g., 466) secured to the structure, a first target material (e.g., 474), a second target material (e.g., 476), and a positioner coupled to the structure, the positioner configured to move the structure between a first position and a second position (p27, lines 7-22), wherein the first radiation filter is adapted to receive a first radiation generated using the first target material, and the second radiation filter is adapted to receive a second radiation generated using the second target material, wherein the second radiation is generated after the first radiation is generated, are described in paragraphs 41-51 of the specification.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are follow: Claims 1-3, 6-13, 21-25, 27-34, 39-42, and 46-55 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,950,493 (Besson).

VII. ARGUMENTS

Claim 1

Claim 1 recites a *disk* located within the cavity, the disk having a first target material and a second target material. Besson does not disclose or suggest such disk. Rather, Besson discloses steering a tube electron-beam from one track to the next (see column 21, lines 52-57), and does not mention anything regarding a disk having first and second target materials. For at least the foregoing reason, claim 1 and its dependent claims are believed allowable over Besson.

Claim 1 also recites a first target material that corresponds with a first portion of a radiation filter, and a second target material that corresponds with a second portion of the radiation filter. Applicant agrees with the Examiner that Besson does not disclose these limitations. According to pages 2 and 7 of the Office Action, column 47, lines 11-38, and column 10, lines 60-65 of Besson allegedly "imply" these limitations. However, column 47, lines 11-38 of Besson merely disclose obtaining a spectrum using x-ray techniques, filtration, and anode target material. There is nothing in the cited passage of Besson that disclose or suggests a first filter portion and a second filter portion that correspond with a first target material and a second target material, *respectively*.

Also, according to the Office Action, in order to obtain a desired spectrum, one would take into account the target material and the type of filter being used. However, Applicant respectfully submits that even if this were true, it does not automatically mean that the system disclosed in Besson has different filter portions corresponding to different respective target materials. This is because, a desired spectrum may be obtained, for examples, with a null filter (no filter), with different target materials that are used with the same filter, or with different filters that are used with the same target material, none of which would require different filter portions to correspond with

respective different target materials. As such a mere disclosure of filtration and target material does not automatically necessitate a finding that the reference suggests first and second filter portions that correspond to first and second target materials, respectively.

Notably, the newly cited passage (column 10, lines 60-65) of Besson also does not disclose or suggest the above limitation. In particular, this passage discloses:

> Other such techniques are to vary X-ray tube electron beam current, the X-ray tube target material selection, the X-ray focal-spot geometry, and/or the X-ray filtering by filter 152 or other filters in paths 132. These techniques may be employed individually or cooperatively at the same time.

As such, the cited passage of Besson merely states that different techniques (for obtaining different X-ray spectrums) may be used together, and does not specifically describe that the target material selection is used specifically with the filtering technique.

Even if the cited passage somehow suggests that the target material selection is specifically used with the filtering technique (which is not true), the cited passage still does not disclose or suggest first and second target materials that correspond to first and second filter portions, respectively. For example, two target materials (T1, T2) may be used with two filters (F1, F2) to generate three spectrums (S1, S2, S3) as follows: S1 is generated using T1 and no filter; S2 is generated using T2 with filter F1, and S3 is generated using T2 with filter F2. However, in this example, the two target materials do not correspond with the two filters, respectively. As such, a mere disclosure of different target materials and filter portions does not automatically necessitate a finding that the reference suggests first and second target materials that correspond with respective first and second target materials. Applicant respectfully notes that a disclosure of a general technique by a reference does not necessitate a finding that a specific implementation of the technique is disclosed or suggested by the reference.

Further, Applicant respectfully notes that a system having a first target material that corresponds with a first portion of a radiation filter, and a second target material that corresponds with a second portion of the radiation filter is advantageous in that it allows generation of first and second filtered radiation that can be individually configured. Such is not possible with existing system in which one target material is used with two filter portions, because in such system, the

filtered radiations generated using the two filter portions both depend on the same target material. Nor is the above advantage possible with existing system in which two target materials are used with one filter, because in such system, the filtered radiations generated using the two target materials both depend on the same filter. Therefore, the claimed subject matter is non-obvious.

For these additional reasons, we believe that claim 1 and its dependent claims are allowable over Besson.

Claims 21 and 39

Claim 21 recites applying a first filter factor to the first x-ray radiation to obtain a first filtered radiation, and applying a second filter factor to the second x-ray radiation to obtain a second filtered radiation. Claim 39 recites that the first radiation filter is adapted to receive a first radiation generated using the first target material, and the second radiation filter is adapted to receive a second radiation generated using the second target material. As similarly discussed with reference to claim 1, Besson does not disclose or suggest these limitations. For at least the foregoing reasons, claims 21 and 39, and their respective dependent claims, are believed allowable over Besson.

Claim 31

Claim 31 recites that *the collection* of the first and the second sets of image data *is synchronized with positions* of the first and the second filters (Emphasis Added). Besson does not disclose or suggest such limitation. According to the Office Action, column 4, lines 39-64 allegedly disclose the above limitation. However, the cited passage merely describes a process of obtaining multi-spectral data, and does not mention anything about first and second filters, nor does the cited passage mentions anything regarding the positions of these filters, much less, synchronizing a collection of sets of image data with the positions of the filters. For these additional reasons, claim 31 is believed allowable over Besson.

VIII. CONCLUSION

For the above reasons, Applicant respectfully submits that rejection of claims 1-3, 6-13, 21-25, 27-34, and 39-55 has been overcome. Accordingly, Applicant requests that the Board of Patent Appeals and Interferences overrule the Examiner and allow claims 1-3, 6-13, 21-25, 27-34, and 39-55.

The Commissioner is authorized to charge any fees due in connection with the filing of this document to Bingham McCutchen's Deposit Account No. **50-4047**, referencing billing number **2018721-7036492002.** The Commissioner is authorized to credit any overpayment or to charge any under payment to Bingham McCutchen's Deposit Account No. **50-4047**, referencing billing number **2018721-7036492002.**

Respectfully submitted,

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APPENDIX A: Pending Claims

Listing of Appealed Claims 1-55.

1. (Previously Presented) An apparatus for use in a radiation procedure, comprising:

a radiation filter having a first portion and a second portion, the first and the second portions forming a layer for filtering radiation impinging thereon, wherein the first portion is made from a first x-ray filtering material, and the second portion is made from a second x-ray filtering material;

a structure having a cavity, the radiation filter in operative association with the structure; and

a disk located within the cavity, the disk having a first target material and a second target material, wherein the first target material corresponds with the first portion of the radiation filter, and the second target material corresponds with the second portion of the radiation filter.

2. (Previously Presented) The apparatus of claim 1, wherein the first and the second target materials are parts of a radiation source, and the apparatus further comprises the radiation source.

3. (Original) The apparatus of claim 2, further comprising a gantry to which the radiation source is secured.

4. (Canceled)

5. (Canceled)

6. (Original) The apparatus of claim 2, wherein the radiation source comprises an anode that includes a rare earth element, a platinum group metal, or combination thereof.

7. (Original) The apparatus of claim 2, wherein the radiation source comprises a voltage generator.

8. (Original) The apparatus of claim 7, further comprising a switching element coupled to the voltage generator, the switching element configured to modulate the voltage generated by the voltage generator.

9. (Original) The apparatus of claim 1, further comprising an imager for generating image data in response to radiation that has been filtered by the layer.

10. (Original) The apparatus of claim 9, wherein the imager has a first image element for generating a first image data in response to radiation that has been filtered by the first portion of the radiation filter, and a second image element for generating a second image data in response to radiation that has been filtered by the second portion of the radiation filter.

11. (Original) The apparatus of claim 9, further comprising a gantry, wherein the imager and the radiation filter are secured to the gantry.

12. (Previously Presented) The apparatus of claim 9, wherein the imager is coupled to a support structure for supporting an object to which filtered radiation is directed.

13. (Previously Presented) The apparatus of claim 1, wherein either or both of the first and the second x-ray filtering materials are selected from the group consisting of aluminum, copper, and molybdenum.

14-20. (Canceled)

21. (Previously Presented) A method for generating image data, comprising:
generating a first x-ray radiation using a first target material;
applying a first filter factor to the first x-ray radiation to obtain a first filtered radiation;
generating a first set of image data in response to the first filtered radiation;
generating a second x-ray radiation using a second target material;

applying a second filter factor to the second x-ray radiation to obtain a second filtered radiation; and

generating a second set of image data in response to the second filtered radiation;

wherein the first and the second filter factor is applied automatically using a machine.

22. (Original) The method of claim 21, wherein the first filter factor is applied by placing a first filter into the x-ray radiation.

23. (Original) The method of claim 21, wherein the second filter factor is applied by placing a second filter into the x-ray radiation.

24. (Previously Presented) The method of claim 21, wherein the first filter factor has a same filtering characteristic as the second filter factor.

25. (Original) The method of claim 21, wherein the first filter factor is different from the second filter factor.

26. (Canceled)

27. (Previously Presented) The method of claim 21, wherein the first filter factor and the second filter factor are applied by placing a first filter and a second filter, respectively, into the first and second x-ray radiation.

28. (Previously Presented) The method of claim 27, wherein the first filter and the second filter are secured to a rotatable structure.

29. (Original) The method of claim 21, wherein the first set and the second set of image data are generated using an imager.

30. (Original) The method of claim 29, further comprising collecting the first set and the second set of image data from the imager.

31. (Original) The method of claim 30, wherein the collection of the first and the second sets of image data is synchronized with positions of the first and the second filters.

32. (Original) The method of claim 21, wherein the first set of image data is generated using a first imager, and the second set of image data is generated using a second imager.

33. (Original) The method of claim 32, further comprising collecting the first set and the second set of image data from the first and the second imagers, respectively.

34. (Original) The method of claim 27, wherein either or both of the first and second filters comprise a material selected from the group consisting of aluminum, copper, and molybdenum.

35-38. (Canceled)

39. (Previously Presented) An apparatus for use in a radiation procedure, comprising:

a structure;

a first radiation filter secured to the structure;

a second radiation filter secured to the structure;

a first target material;

a second target material; and

a positioner coupled to the structure, the positioner configured to move the structure between a first position and a second position, wherein the first radiation filter is adapted to receive a first radiation generated using the first target material, and the second radiation filter is adapted to receive a second radiation generated using the second target material, wherein the second radiation is generated after the first radiation is generated.

40. (Original) The apparatus of claim 39, wherein the structure comprises a wheel.

41. (Original) The apparatus of claim 39, wherein the positioner comprises a motor.

42. (Original) The apparatus of claim 39, wherein either or both of the first and the second radiation filters is made from a material selected from the group consisting of aluminum, copper, and molybdenum.

43. (Previously Presented) The apparatus of claim 1, wherein the first target material forms a ring configuration.

44. (Previously Presented) The apparatus of claim 1, wherein the first target material and the second target material are positioned concentrically relative to each other.

45. (Previously Presented) The apparatus of claim 1, wherein the first target material and the second target material are positioned relative to each other in a side-by-side configuration.

46. (Previously Presented) The apparatus of claim 1, further comprising an electron gun for sending electrons towards the first or the second target material.

47. (Previously Presented) The apparatus of claim 46, further comprising an electron deflector for changing a path of the electrons.

48. (Previously Presented) The apparatus of claim 47, wherein the electron deflector comprises an electromagnetic field generator.

49. (Previously Presented) The apparatus of claim 47, wherein the electron deflector comprises a magnetic field generator.

50. (Previously Presented) The apparatus of claim 47, wherein the electron deflector physically deflects the electrons.

51. (Previously Presented) The apparatus of claim 1, further comprising a gantry to which the structure is secured.

52. (Previously Presented) The apparatus of claim 1, wherein the structure is a part of a MRI machine.

53. (Previously Presented) The apparatus of claim 1, wherein the structure is a part of a PET machine.

54. (Previously Presented) The apparatus of claim 1, wherein the first x-ray filtering material comprises a k-edge filter.

55. (Previously Presented) The apparatus of claim 1, wherein the first x-ray filtering material has a x-ray transmission window that is above a k-edge, and the second x-ray filtering material has a x-ray transmission window that is below the k-edge.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None